The Canadian Entomologist

VOL. LX. ORILLIA, FEBRUARY, 1928. No. 2.

NOTES ON THE COLLECTION OF MALLOPHAGA.

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Probably no groups of living things offer greater difficulties to the student of science than do the parasitic insects. The Mallophaga, or bird and mammal biting lice, stand as an example of this. At the present time there is no species of this order or suborder for which we have the complete life history. There is also a paucity of species descriptions, and host records. Much of the lack of knowledge concerning this group of insects is due, no doubt, to the difficulty of obtaining specimens and the greater difficulty of knowing exactly the host from which a given specimen is taken.

The method, which in the past has furnished us with the most of our material and which no doubt is still being used, questionable as it is, is the use of museum bird skins. It has been customary to examine painstakingly these dried skins for Mallophaga and to credit the Mallophaga found to the bird species examined. Many inaccuracies have surely crept into our literature from this procedure, as anyone familiar with the methods of bird collectors and taxidermists will readily appreciate.

It is at present recognized that in order to insure host accuracy, Mallophaga must be taken from the freshly killed bird.

The author, while working on a preliminary study of the Mallophaga of New York State under the guidance of Dr. Matheson of Cornell University, at first examined the feathers of some freshly killed birds for lice. Such examinations were always tedious and resulted in finding very little material. The birds were then skinned and prepared for the Cornell Ornithological Museum, the skins being made up as directed by Chapin, (23). This included wrapping the skins in cotton and leaving until they were dry. It was noticed, when the cotton was removed, that lice were found on the inside of the cotton wrappings. They were alive in many cases but the fluffiness of the material made the movement of the Mallophaga extremely difficult. The white background also made it very easy to pick off the lice by holding the cotton up to the light.

Because this method of collecting shows very distinctly that Mallophaga leave soon after the death of the host and because it assures positive knowledge of the host, the following procedure can be recommended.

As soon as the bird has been shot in the field, the wounds cared for and the throat plugged, wrap the bird in fresh cotton. Place the bird in a paper bag and label the bag with number, date, and locality. Skin the bird as soon as possible, prepare it, and wrap the skin in cotton, using either new cotton or that already used in the field. Place the skin in the same bag to dry. Care should be taken to keep the birds widely separated during drying because that is the period at which the Mallophaga are most active in leaving the feathers. The cotton may be examined as soon as the skin is dry or may be placed in the paper to await examination at a later date.

In addition to lice, the author has found mites and, in the case of mammals, fleas entangled in the cotton.

The above method, with the cooperation of Ornithologists and Entomologists, ought to stimulate and further our knowledge of this little known group of insects.

ON THE NESTING HABITS OF MELISSODES LATR. (HYMENOP.).

BY CLARENCE P. CUSTER,
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It was in the early days of August, as I approached the armory at Boulder, that I came across the nests of *Melissodes obliqua* Say.[1] Careful examination disclosed eight entrances in an area of four square meters. This had been traversed by automobiles and so was without vegetation. The bees had constructed tunnels which led at first straight down and then suddenly turned off to one side. Ceaselessly, the males of the colony were darting back and forth. Occasionally, a female circled her way in from the fields, her hind legs bright yellow with their heavy loads of pollen. Then, almost inevitably, the males rushed in on all sides. There was a collision in mid-air and a sudden descent to the ground. Before the males could gather themselves together, the female was on her way. Quickly she made her way to the nest, hovered over the entrance, dropped in head first and was gone.

The first thing to be done was to determine the plants the bees were visiting. A short distance away wild flowers were growing in profusion. Hundreds were within a radius of ten yards. And so it was but a short time before I found the bees on the flowers of the two most common plants. These were *Grindelia squarossa* and *Helianthus petiolaris*. Later, a microscopic examination of the pollen from the cells in the nests disclosed the two types of prickly grains of these flowers. Apparently they were the main source of pollen.

These facts led me to conclude that we have here a bee that follows its pollen plants each season. It nests where its particular flowers are most abundant. Hence it would not use the same locality each year. In fact, I have never seen the nests of this bee at the armory before. It is a new arrival. And the chances are that it will be gone next season to a more favorable hunting ground. As explained by Robertson, such a habit enables the bee to increase its pollen collecting efficiency. Since the flowers are close to the nest, its flight is short. More loads are secured in a given time than in the case of such bees, as *Dianthidium sayi* Ckll., which nest repeatedly in the same locality regardless of the success of the local flora.

The parasites of *Melissodes* are bees of the genus *Triepeolus*. Large numbers of these were seen flying low, a centimeter or two from the ground, in the vicinity of the nests. I noticed one that would carefully examine every crack and crevice until she came upon a nest. Here she would alight on a nearby stone on the side away from the nest. Then she would cautiously watch for the return of the owner. No sooner had the latter arrived and entered the nest, than the parasite was hovering over the entrance. She alighted on the edge and cautiously descended. Presently, another parasite, a large *Triepeolus concavus* Cress., arrived

1.—Determined by Miss Grace Sandhouse.

and entered the nest without hesitation. She had probably visited it before. Still other parasites arrived and entered until there were at least six in the nest. These had been in for a full minute when another pollen-laden bee returned and dropped down through the entrance. No sooner had she disappeared than up came a parasite. It had passed her in the antechamber which is shown in Fig. 1. During the quiet hours of the night when the workers are resting from their day of toil, I have found the parasites creeping through the galleries or waiting, with others of their kind in the passage near the entrance, for the dawn of another day.

Since the parasites of this species have not been definitely determined, I carefully secured the cells, when a nest was dug out, and placed them in soft moist earth in a box. This will be kept at room temperature throughout the winter. In all probability the hosts and parasites can thus be bred. Only one of the sexes of some of the *Triepeoli* are known and so this method is the best to identify them together.

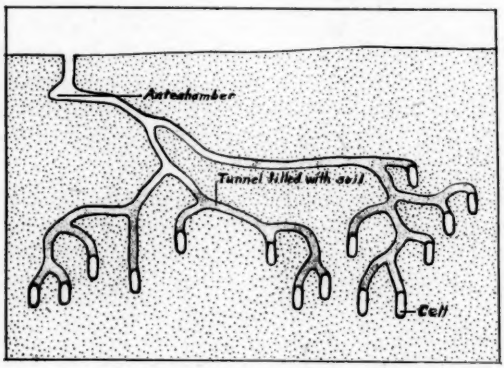
But there are many difficulties which arise when one attempts to rear such insects in the laboratory. The earth must be kept moist or the larvae will dry out. And if it is kept too moist, mold will develop. This also will kill them. Mold can probably be eliminated if the box is exposed to the sunlight for a few minutes each day.

The parasites are quite bold in the presence of the host. Some will arrive at a nest when a host, ready to leave, has her head in the entrance. As soon as her abdomen is out of the passage, they will crowd in. The host pays no attention to them whatsoever. After coming in from the fields with her load of pollen, she will even wait for a parasite to come out if it happens to be in the entrance. In some cases, the parasite merely steps aside into the antechamber and lets her pass. At this colony I saw more parasites than hosts. It strikes me as remarkable that the host can leave any offspring in such a state of affairs.

Some of the nests had one owner; others had more. By placing twigs in the entrances, I prevented any bees from coming out. Then, when a female would come in from the fields, she would start digging around the twig that blocked an entrance. I had but to withdraw the stick and she plunged into the nest. In the meantime, I marked her thorax with a bit of white paint. In this manner I determined that one nest was inhabited by eight, another by three, two others by two apiece and the rest by one bee each. By the marks on the thorax I further showed that no bee was constructing two nests simultaneously as is the case with the bee *Dianthidium sayi* Ckll.

It now remained to investigate the architecture of the nest. Those with more than one owner were quite complicated. So several of the nests inhabited by just one bee apiece were considered most typical. One of these is shown in Fig. 1. The walls of the tunnelway were hard and glazed for a short distance from the entrance. The antechamber was characteristic of these nests. It varied in size, shape and location. In some it consisted of a distinct lateral tunnel a centimeter or two in length; in the nest inhabited by eight bees, it was located three centimeters further down the tunnel and was merely an accentuated outpocketing of the outer wall of a sharp curve. Generally, one finds it about a centimeter from the entrance. Without a doubt it is constructed so that one worker, coming in, may pass another going out. This explanation is all right in

the case of nests with more than one owner. But why was it constructed in the nests used by but one bee? The explanation is probably to be found in instinct. Possibly the nests with just one bee represent those with a single survivor. At any rate, the antechamber always has its uses. If other workers do not find it convenient, then parasites will. I even suspect that the host uses it when the parasites want out. In such a manner the host and parasite are so intimately related.



Hardly a meter from this colony of large bees, there were established dozens of the nests of those most remarkable bees of the genus *Halictus*. There, the owners had taken extensive precautions against the parasites. In each nest there was a door. And each door was nothing more nor less than the head of a female which served in that capacity. No parasites were permitted to enter here. The male Halictines were constantly seeking entrance. But even they were shut out. Only the females, returning from the fields with pollen, were permitted to pass. To do so the doorkeeper stepped back into the tunnel. Here, the passageway, two or three times as wide as at the entrance, formed a chamber quite different from the one in the nest of *Melissodes*. Thus the new arrival was able to pass by and the door-keeper could resume her post.

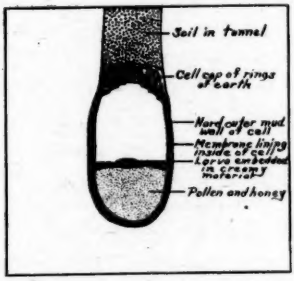
After considerable observation of the nest of the eight Melissod bees, I was surprised to find that another species of the same genus, half as large and covered with light brown hair, was also making use of the nest. Upon my digging up the nest, two of these latter made their escape from a narrow tunnel which branched off from the wider tunnel. In looking through the literature, I find no reference to two different species of the same genus using the same nest. It is interesting to note that other individuals of this same small species had constructed their own nest a half meter or so away.

At a deeper level I came upon the cells with their larvae. These, as shown in the figure, were arranged in groups at the ends of tunnelways. The long axis of each cell was in a vertical position. A typical cell was found to be cylindrical in shape with moist, smooth walls. See Fig. 2. It measured 2.1 by 1.1 centimeters. The lower third was filled with pollen almost liquid with honey.

Across the pollen lay the egg. On top of this there was a white cream-colored layer 2 mm. thick. According to Malyshev (3), in Russia, this latter area, which he describes as a greasy pellicle, is present on top of the pollen collected by *Macrocera malvae* Rossi.

The wall of the cell of *Melissodes obliqua* is composed of a thin outer shell of dried mud inside of which there is a semitransparent membrane. Malyshev also reports that a similar membrane lines the walls of the cells of *Melitta leporina* Panz., *Panurginus labiatus* Ev. and *Macrocera malvae*. Such a membrane is also present in the cells of the bees of the genus *Anthophora*.

The wall of the Melissod cell was closed at the top by an arched roof of unpolished clay arranged in concentric rings. Malyshev also informs us that the lids of the cells of *Melitta leporina, Macrocera malvae* and *Systropha planides* Gir. are "earthy and spiral." Above the cell, the passageway is invariably filled with soil.



In no case have I found any cell with more than one egg or embryo. This supports Faber's (1) contention that the parasite's egg hatches out first and destroys that of the host. I have noticed that some of the larvae, presumably parasites, possessed thin, sharp mandibles a short time after having hatched. Most of the nests used by one bee yielded about 15 larvae. Some of them, full grown, completely filled the cell. They were distinctly yellow from the pollen which they had hastily eaten before mold could get to it.

Of the many parasites which I have seen in the vicinity of the nests, the giant *Triepeolus concavus* Cress. seems to be the most logical one for this bee. The large size of the parasite corresponds quite closely to that of the bee which I think is its host. This problem we will leave to the future.

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2.—Malyshev, S. '23 The Nesting Habits of *Melitta leporina* Panz. (Hym., Apidae). Bulletin de l'Institut Lesshaft, T 6:2-7.

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SOME NEW ODONATA NYMPHS

BY ELSIE BROUGHTON,
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The following descriptions have been taken from specimens in the collection of Professor James G. Needham at Cornell University. Brief diagnostic characters of each have been listed by him in his forthcoming *Handbook of North American Dragonflies.*

Gomphus crassus Hagen.

Described from specimens in the Cornell University collection labelled, Timonton Lake, Indiana.

Nymph Total length 29 mm., abdomen 18.5 mm., hind femur 5.5 mm.; width of head 5 mm., of abdomen 6.5 mm.

Median lobe of labium with its front margin nearly straight and fringed with scurfy hairs; teeth of the lateral lobe 8-9, the end one pointed and somewhat incurved. Sides of the abdomen nearly parallel, narrowed beyond the 7th segment. Lateral spines on 6 to 9, increasing in size posteriorly; the spine of 9 about ¾ the length of the segment and almost twice as long as segment 10. Dorsal hooks on 8 and 9; a groove on the preceding segments. Relative lengths of segments 8:9:10: appendages as 8:10:3:6.

Gomphus hybridus Williamson.

Exuviae of this species were sent to Prof. Needham some years ago by Mr. E. B. Williamson who described the adult (Ent. News '02, p. 47). They were collected in Cumberland and Stone Rivers near Nashville, Tenn.

Nymph Total length 27 mm. abdomen 18 mm., hind femur 5 mm.; width of head 4.5 mm., of abdomen 6.5 mm.

Median lobe of labium straight, fringed, and bearing a sharp median tooth; lateral lobes with 8-9 arcuate teeth. Sides of abdomen more or less parallel, widest across segment 6. Lateral spines on 6 to 9, increasing in size posteriorly, those of 9 about equal to the dorsum of 9, and 1½ times the length of segment 10. Dorsal hooks minute on 8 and 9, rudimentary on 7; a dorsal groove on the preceding segments.

Relative lengths of segments 8:9:10:appendages as 8:10:3:5.

Gomphus minutus Rambur.

Collected by Prof. Needham at Lake Alice near Weewahitchka, Florida, April 8, 1927.

Nymph Total length 26 mm, abdomen 19 mm., hind femur 5 mm.; width of head 4.5 mm., of abdomen 4.5 mm.

Median lobe of labium with its anterior margin convex, fringed, and with a double median tooth; end tooth of lateral lobe well developed, followed by 1 pointed and 8 arcuate teeth. Abdomen with nearly parallel sides, tapering gradually to rearward beyond the 5th segment. Lateral spines minute and sharp on 7 to 9. No dorsal hooks and only a suggestion of an impressed middorsal line along the basal segments. Relative lengths of segments 8:9:10:appendages as 6:10:6:4.

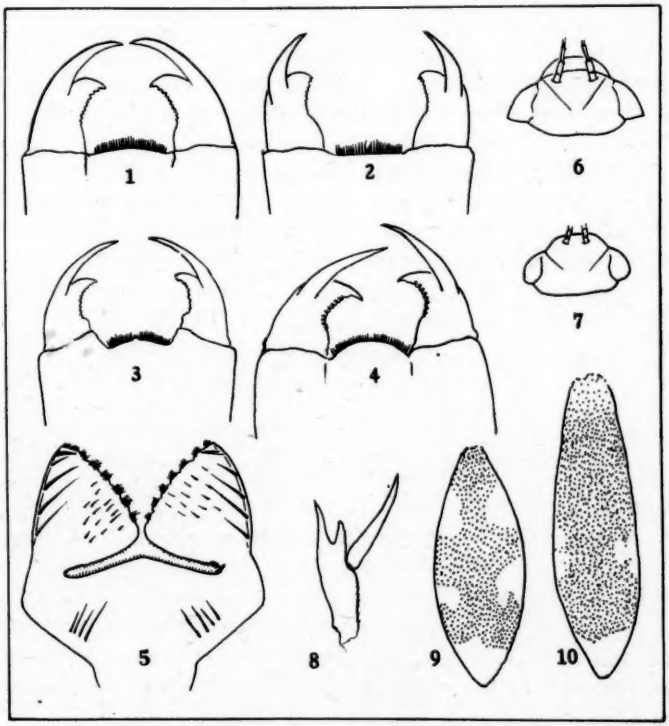
Gomphus cavillaris Needham.

Collected by Prof. Needham at Chipola Lake, Florida, April 5, '27.

Nymph Total length 30 mm., abdomen 21 mm., hind femur 6 mm.; width

of head 5.5 mm., of abdomen 6.5 mm.

Median lobe of labium with its front margin convex, densely fringed with hairs and bearing a small median tooth; lateral lobes with sharp, incurved end tooth followed by 10 arcuate teeth, the last being very rudimentary. Abdomen with more or less parallel sides, tapering to rearward beyond the 6th segment. Lateral spines on 7 to 9, those of 9 about 1-6 the length of the segment. Rudimentary dorsal hooks on 7 to 9 (possibly on 4 to 6 also). Relative lengths of 8:9:10:appendages as 7:10:5:4.



Labia of 1. *G. crassus.* 2. *G. hybridus,* 3. *G. minutus,* 4. *G. cavillaris,* 5. *Epicordulia regina.* Outline of head of *Celithemis,* 6. *fasciata,* 7. *ornata,* 8. Lateral lobe of labium of *Argia translata,* 9. Lateral gill, 10. median gill of *A. translata.*

Epicordulia regina Selys.

Prof. Needham collected a large number of this species at Spring Creek, Georgia, April 10, 1927.

Nymph Total length 28 mm., abdomen 18 mm., hind femur 10 mm.; width of head 7.5 mm., of abdomen 13 mm.

Lateral lobes of labium each with 8 crenulations; 4 lateral and 4 mental setae on each side. Abdomen nearly circular in outline, widest across segment 7. Lateral spines on 8 and 9; of 8 sharp and incurved, about one third as long as the segment; of 9 not much longer, if any, than segment 9, and surpassing but a little the tips of the appendages. Large, cultriform, dorsal hooks on 2 to 9, highest on 6. Relative lengths of 8:9:10:appendages as 10:8:2:9.

Tetragoneuria stella Williamson.

A large number of cast skins collected by Prof. Needham at Chipola Lake, Florida, are thought to be of this species. They are not unlike the nymphs of *T. cynosura*.

Nymphs Total length 19 mm., abdomen 12 mm., hind femur 6.5 mm.; width of head 5.5 mm., of abdomen 7 mm.

Dorsal hooks on segments 2 to 9, highest on 6 to 8, cultriform. Lateral spines on 8 to 9; on 8 minute, on 9 as long as the segment and far surpassing the tips of the appendages. Lateral setae 7-8; mental setae 9-10.

Celithemis fasciata Kirby. . .

Cast skins collected by Prof. Needham at Lake Hall, Talahassee, Fla., were recognized by him as being of this species. Others in the Cornell University collection labelled "Dead Pond, Rock Bluff P.O. Fla." and "from Ga., J. C. Bradley col." are evidently the same.

Nymph Total length 18 mm., abdomen 11 mm., hind femur 6 mm.; width of head 4.2 mm., of abdomen 5.4 mm.

Dorsal hooks on 4 to 7, highest on 6, rudimentary on 4. Lateral spines on 8 and 9; of 8 one half as long as segment 8; of 9 reaching about to the tips of the appendages. Lateral setae 8-9; mentals 10-11. Rear angles of eyes very sharply pointed.

Celithemis ornata Rambur.

Cast skins collected at Lake Alice, Weewahitchka, Fla., by Prof. Needham.

Lateral spines of 8 about one third as long as segment 8, of 9 barely reaching tip of appendages. Hind margin of eyes not sharply pointed as in *fasciata* but rounded. Lateral setae 8.

Argia translata Hagen.

Dr. P. P. Calvert sent this specimen to Prof. Needham with permission to describe it. It bears the label "Cobb Creek between Penfield and Beechwood Pk., Pa. June 1, 1916. Imago preserved. P. P. Calvert."

Nymph Length 12.5 mm., gills 5 mm., additional, abdomen 8 mm.; width of head 3.2 mm.

Wing tips reaching to the middle of the fifth segment. Gills widest near or just beyond the middle; lateral gill with a pale tip and with two pale spots on each lateral margin, one about one third and the other two thirds the distance from the base to the tip; median gill with a pale tip and a suggestion of the distal pair of pale spots.

THE SUBGENUS PLATYDERIDES IN NORTH AMERICA (COLEOPTERA).*

BY W. J. BROWN,
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(Continued from page 21).

16. **Aphodius punctissimus** n. sp.

Length 4.5-6 mm.; width 2.2-3 mm. Oblong, moderately convex and elongate, parallel. Head, pronotum, and ventral thoracic sclerites black; apical margin of clypeus and lateral pronotal margins broadly reddish brown; elytra dark reddish brown; legs and abdomen reddish brown; strongly shining.

Head almost three-fourths as wide as pronotum; moderately convex; without trace of tubercles; finely punctulate, the punctures moderately sparse, finer at middle. Clypeus broadly and shallowly emarginate, the angles on each side very broadly rounded. Genae moderately prominent, rectangular, fimbriate.

Pronotum about three-fifths as long as wide; the angles obtuse and very broadly rounded; the sides broadly and strongly explanate, feebly arcuate; base arcuate, not sinuate, without trace of marginal line. Pronotal disk with a vague depression before each hind angle; puncturation intermixed, the smaller punctures very fine and sparse throughout; the larger punctures very coarse, usually confined to sides and basal two-thirds, sparse at middle, very dense on the sides, and confluent in the depressions before the hind angles. Scutellum distinctly punctate.

Elytra at base slightly narrower than the pronotum; the sides feebly arcuate; humeri obtuse. Elytral disk finely striate; striae very closely and rather coarsely punctured; intervals very feebly convex, sparsely punctate, the punctures somewhat finer than those of the striae, coarser than usual.

Mesosternum alutaceous, the sides closely punctate, the intercoxal process not carinate. Metasternum punctate throughout, the sides alutaceous. Abdomen alutaceous, rather coarsely and closely punctate. Ventral face of anterior femur with a few hair bearing punctures. Anterior tibia strongly tridentate, the margin serrate above the upper tooth. Middle and hind femora very sparsely and indistinctly punctate, each with a few coarse punctures near the apex. First segment of posterior tarsus slightly shorter than the three following.

Male. Head and pronotum usually less distinctly punctured. Anterior tibial spur laterally compressed, slender, parallel, and slightly sinuate when viewed anteriorly, stout when viewed from the side, moderately curved, bluntly pointed at apex. Minor spur of middle tibia about half as long as the major, obliquely truncate and bluntly pointed at apex. Posterior femur with a small, inconspicuous patch of yellow hairs near posterior margin at trochanter.

Female. Anterior tibial spur less stout, less strongly curved, the apex acute. Minor spur of middle tibia as in the male but acute at apex. Posterior femur without patch of hairs.

Holotype— ♂, Payne Co., Oklahoma, November 10, 1925, (W. J. Brown); No. 2642 in the Canadian National Collection, Ottawa.

Allotype.— ♀, same data as the holotype.

Paratypes—23 ♂, 29 ♀, Payne Co., Oklahoma, October 23 to December 6, 1925 and 1926.

In the type series of the present species, there is some variation in the

sculpture of the head and sometimes the smaller punctures of the pronotum are so fine that they are rather indistinct; in most of the specimens, these punctures are less fine and very distinct. This variation is imperfectly correlated with sex, the females usually being more strongly punctate. The species is difficult to separate; its characters are compared with those of its allies in the notes following the description of *oklahomensis*.

17. **Aphodius oklahomensis** n. sp.

Length 5.6-7 mm.; width 2.3-3.5 mm. Oblong, moderately convex and elongate, parallel. Head, pronotum, and ventral thoracic sclerites black; apical margin of clypeus and lateral pronotal margins broadly reddish yellow; elytra red or pale reddish brown; legs and abdomen reddish yellow, the tibiae somewhat darker; strongly shining.

Head about three-fourths as wide as the pronotum; moderately convex; without trace of tubercles; clypeus sparsely, very finely, and indistinctly punctulate; front and genae finely, sparsely, and distinctly punctate. Clypeus broadly and shallowly emarginate, the angle on each side very broadly rounded. Genae moderately prominent, rectangular, fimbriate.

Pronotum about three-fourths as long as wide; the angles obtuse, broadly rounded; the sides broadly and strongly explanate, feebly arcuate; base arcuate, not sinuate, without trace of marginal line. Pronotal disk with a distinct depression before each hind angle; puncturation intermixed; the smaller punctures very sparse, so fine that they are indistinct, sometimes absent from a large median area; the larger punctures confined to the sides and basal fifth, sparsely placed on the base, close on the sides, and confluent in the depressions of the hind angles. Scutellum impunctate except at base.

Elytra at base slightly narrower than the pronotum; the sides feebly arcuate; the humeri obtuse. Elytral disk finely striate, striae very closely and rather coarsely punctate; intervals very feebly convex, very finely and sparsely punctate.

Mesosternum alutaceous at middle, roughly punctate on each side; the intercoxal process not carinate, roughly punctate. Metasternum sparsely punctate at middle, alutaceous and rather closely punctate on the sides. Abdomen alutaceous, rather closely and coarsely punctate. Ventral face of anterior femur with two confused rows of hair bearing punctures. Anterior tibia strongly tridentate, serrate above the upper tooth. Middle and posterior femora sparsely and indistinctly punctate, each with a few coarse punctures near apex. First segment of hind tarsus subequal in length to the three following.

Male. Anterior tibial spur stout, strongly curved, the apex bluntly pointed. Minor spur of middle tibia less than half as long as the major, the apex obliquely truncate and acutely pointed. Middle femur with a few hair bearing punctures on posterior margin. Posterior femur with a small patch of sparse hairs on posterior margin near trochanter.

Female. Anterior tibial spur slender, moderately curved, acute at apex. Minor spur of middle tibia more than half as long as the major, the apex acute. Middle and hind femora almost glabrous.

Holotype— ♂, Payne Co., Oklahoma, November 20, 1925, (W. J. Brown);

No. 2643 in the Canadian National Collection, Ottawa.

Allotype—♀, same data as holotype.

Paratypes—15 ♂, 33 ♀, Payne Co., Oklahoma, November 10 to December 12, 1923, 1925, and 1926.

This species is very closely allied to *punctissimus, socialis,* and *talpoidesi,* all of which are very difficult to separate. The present species is separated by its larger size, paler elytra, more strongly explanate and paler pronotal margins, and by the puncturation of the dorsal surface; it is the only one of the four in which the male anterior tibial spur is not laterally compressed. The outstanding character of *punctissimus* is the comparatively coarse, close puncturation of the elytral striae; the species agrees with *oklahomensis* in having the pronotal side margins strongly explanate and broadly pale. In *talpoidesi* and *socialis,* the pronotum is less strongly explanate and is usually concolorous; occasionally the sides are indistinctly paler near the margins. The outstanding character of *talpoidesi* is found in the puncturation of the pronotum, the punctures being less numerous than in any of the others. In this species also, the elytral intervals near the suture are impunctate while those on the sides are distinctly punctate. In all these species, the elytral puncturation becomes more distinct toward the sides, but it is only in *talpoidesi* that the two or three intervals of each elytron nearest the suture are impunctate. In sculpture, *socialis* approaches *punctissimus,* and differs by the less coarsely and closely punctate elytral striae, the darker color, and the less strongly explanate pronotal margin. The puncturation of the dorsal surface is somewhat variable in all these species except *oklahomensis* in which it is relatively constant. Some of this variation is sexual, especially in *talpoidesi.*

18. **Aphodius talpoidesi** n. sp.

Length 4.6-5.8 mm.; width 2-2.6 mm. Oblong, moderately elongate and convex, parallel. Head, pronotum and ventral surface black; apical margin of clypeus and sometimes lateral pronotal margins broadly reddish brown; legs and elytra brownish red; surface strongly shining.

Head slightly more than two-thirds as wide as pronotum; moderately convex; without trace of tubercles; very finely and sparsely punctulate or apparently impunctate. Clypeus broadly and shallowly emarginate, the angle on each side very broadly rounded. Genae moderately prominent, rectangular, fimbriate.

Pronotum three-fifths as long as wide; the angles obtuse and very broadly rounded; the sides broadly, feebly explanate and feebly arcuate; base arcuate, without trace of marginal line; pronotal disk with a vague depression before each hind angle; pronotal puncturation intermixed, the smaller punctures very fine, sparse, and often indistinct, sometimes extending throughout and sometimes confined to sides and basal region; the larger punctures very coarse, confined to the sides but sometimes extending toward middle on basal third, sparse and irregular in distribution except in the depressions of the hind angles where they become confluent. Scutellum very finely and sparsely punctulate or apparently impunctate.

Elytra at base slightly narrower than the pronotum, the sides feebly arcuate; humeri obtuse. Elytral disk finely striate, the striae closely, not coarsely punctured; intervals very feebly convex, the first three or four impunctate or apparently so except near apex, those near the sides very finely and sparsely but

distinctly punctate.

Mesosternum alutaceous, the sides closely punctate, the intercoxal process not carinate. Mestasternum punctate throughout, the sides alutaceous. Abdomen alutaceus, rather coarsedly and closely punctate. Ventral face of anterior femur with a few hair-bearing punctures; the tibia strongly tridentate, its margin feebly crenate above the upper tooth. Middle and posterior femora very finely, sparsely, and indistinctly punctate, each with a few coarse punctures. First segment of posterior tarsus slightly shorter than the three following.

Male. Head impunctate or apparently so except near margins. Pronotum impunctate except near base and sides. Elytral intervals and scutellum slightly less distinctly punctured. Anterior tibial spur laterally compressed, slender, parallel, and slightly sinuate when viewed anteriorly, stout when viewed from the side, moderately curved, the apex bluntly pointed. Minor spur of middle tibia about half as long as the major, the apex rather blunt. Posterior femur with a small patch of yellow hairs on posterior margin near trochanter.

Female. Head distinctly punctate throughout. Pronotum visibly punctulate at middle, the coarse punctures of the sides more numerous. Anterior tibial spur less stout, not compressed, feebly curved, acute at apex. Minor spur of middle tibia as in the male but acute at apex. Posterior femur without patch of hairs.

Holotype.— ♂, Aweme, Manitoba, November 2, 1927, (S. Criddle); No. 2767 in the Canadian National Collection, Ottawa.

Allotype.— ♀, same data as holotype.

Paratypes.—22 ♂, 26 ♀, same data.

The characters of this species are compared with those of its allies in the notes following the description of *oklahomensis*. This species occurs in nests of the pocket gopher.

19. **Aphodius socialis** n. sp.

Length 4.7-6 mm.; width 2-2.7 mm. Oblong, moderately elongate and convex, parallel. Head, pronotum and ventral surface black; apical margin of clypeus and rarely the lateral pronotal margins narrowly reddish brown; elytra very dark reddish brown; legs reddish brown; strongly shining.

Head about two-thirds as wide as pronotum; moderately convex; without trace of tubercles; finely punctate, the punctures moderately sparse, finer at middle. Clypeus broadly and shallowly emarginate, the angle on each side very broadly rounded. Genae moderately prominent, rectangular, fimbriate.

Pronotum about three-fifths as long as wide, the angles obtuse and very broadly rounded; the sides rather broadly but feebly explanate, feebly arcuate; base arcuate, without trace of marginal line. Pronotal disk with a depression before each hind angle; puncturation intermixed, the smaller punctures very fine and sparse throughout, sometimes indistinct in front at middle; the larger punctures very coarse, usually confined to the sides and basal half, sparse to moderately dense on the sides, confluent in the depressions of the hind angles, very sparse elsewhere. Scutellum with a few fine punctures.

Elytra at base slightly narrower than the pronotum, the sides feebly arcuate, the humeri obtuse. Elytral disk finely striate, the striae closely, not coarsely punctured; elytral intervals very feebly convex, sparsely and finely punc-

tate, the puncturation indistinct near the suture.

Mesosternum alutaceous, the sides closely punctate, the intercoxal process not carinate. Metasternum punctate throughout, the sides alutaceous. Abdomen alutaceous, moderately coarsely and closely punctate. Ventral face of anterior femur with a few hair-bearing punctures. Anterior tibia strongly tridentate, the margin crenate above the upper tooth. Middle and posterior femora indistinctly, very finely and sparsely punctate, each with a few coarse punctures. First segment of posterior tarsus slightly shorter than the three following.

Male. Head usually less strongly punctate. Pronotum with fewer coarse punctures, these usually confined to the sides; the disk at middle usually apparently impunctate. Anterior tibial spur laterally compressed, slender and parallel when viewed anteriorly, stout when viewed from the side, stout, bluntly pointed at apex. Minor spur of middle tibia about half as long as the major, the apex bluntly pointed. Posterior femur with a small patch of yellow hairs on hind margin near trochanter.

Female. Head more distinctly punctate. Pronotum with more coarse punctures, these usually extending to middle in the basal region, the smaller punctures usually distinct throughout. Anterior tibial spur less stout, feebly curved, not compressed, acute at apex. Minor spur of middle tibia as in the male but acute at apex. Posterior femur without patch of hairs.

Holotype.— ♂, Aweme, Manitoba, November 2, 1927, (S. Criddle); No. 2768 in the Canadian National Collection, Ottawa.

Allotype.— ♀, same data as holotype.

Paratypes.—16 ♂, 22 ♀, same data.

The characters of this species are compared with those of its allies in the notes following the description of *oklahomensis*. This species occurs in the nests of the pocket gopher.

20. **Aphodius brevicollis** Lec.

A. brevicollis LeConte, Bull. U. S. Geol. Surv., IV, 2, 455, 1878.
A. brevicollis Horn, Trans. Am. Ent. Soc., XIV, 32, 1887.
A. brevicollis Schmidt, Arch. Naturg., LXXIXA, fasc. 11, 123, 1913.
A. brevicollis Schmidt, Das Tierreich, lief. 45, 48, 1922.

In the collection at hand are two females of this species, one from Darlingford, Manitoba (W. R. Metcalf), and one without locality label. The most outstanding character of the species is the roughly punctate apical half of the clypeus. This character together with the impunctate elytral intervals will separate *brevicollis* from all other species of the subgenus, *haldemani* and *iowensis* approaching it most closely. The type is described as lacking the basal marginal line of the pronotum; this line is distinct at middle and obsolete on each side in the specimens at hand. The species was described from Nebraska.

21. **Aphodius haldemani** Horn.

A. politus Horn, Trans. Am. Ent. Soc., III, 128, 1871.
A. haldemani Horn, l. c., XIV, 33, 1887.
A. haldemani Schmidt, Arch. Naturg., LXXIXA fasc. 11, 123, 1913.
A. haldemani Schmidt, Das Tierreich, lief. 45, 48, 1922.

This species is represented in the collection at hand by five males and nine females from Payne Co., Oklahoma, and Douglas Co., Kansas (W. J. Brown), Except for color, these agree with Horn's type which came from Texas and which he described as rufo-testaceous and again as pale ferruginous. According to Mr. E. T. Cresson, Jr., the type is concolorous, light brown, almost yellow. The spec-

imens at hand have the head, pronotum, and ventral thoracic sclerites black, the margin of the clypeus and the pronotal sides broadly reddish brown, the elytra and legs clear red, and the abdomen dark reddish brown. In one of the Oklahoma specimens, the pronotum is dark reddish brown throughout. Although such variation in color is very unusual, the large size, high polish, very feeble sculpture, and remarkable sexual characters make it very improbable that the bicolored specimens are distinct. In fresh specimens, a very sparse, almost microscopic puncturation is observable on the head, pronotum and elytral intervals.

The sexual characters of the species are as follows:

Male. Spur of anterior tibia elongate triangular, broadest and truncate at apex. Minor spur of middle tibia almost half as long as the major, stout, feebly curved, the apex dilated, almost squarely truncate, and with the inner angle very acute. Middle femur densely hairy on posterior third. Posterior femur densely hairy on posterior third of basal half. Posterior trochanter densely hairy.

Female. Anterior tibial spur stout but slender, strongly incurved, the apex very acute. Minor spur of middle tibia fully half as long as the major, slender, the apex acute. Middle femur and posterior femur and trochanter with a few scattered hairs.

THREE NEW DOLICHOPODIDS FROM WESTERN CANADA (DIPT.).

BY M. C. VAN DUZEE,
Buffalo, N. Y.

Medetera intermedia n. sp.

Male: Length 1.8 mm. Front and face opaque brown. Antennae small, black, arista as long as the face, palpi black; proboscis shining black with a few short yellow hairs; lower orbital cilia whitish.

Thorax and abdomen black, the former with rather thick whitish pollen on the dorsum (the thorax in the type is shrivelled so it is difficult to tell whether it is vittate or not); bristles of thorax black; scutellum with one pair of marginal bristles; propleura with one black bristle above fore coxae; pleura with a few yellow hairs. Abdomen dulled with gray pollen, its hairs small, yellow. Hypopygium shining black.

Coxae and femora black; fore coxae with pale hairs; tibiae and base of fore and middle tarsi yellowish, remainder of tarsi blackish; posterior basitarsi narrowed at base below, but I cannot see any tooth on the narrowed portion; joints of fore tarsi as 17-14-11-6-5; those of posterior pair as 11-30-15-8-7. Calypters, their cilia and the halteres yellow.

Wings grayish; last section of fourth vein straight, ending slightly back of the apex of the wing; last section of fifth vein and the cross-vein of equal length.

Type, male, No. 2497 in Canadian National Collection, taken by Kenneth M. King, July 17, 1925, at Fort a la Conne, Sask. Described from one male.

Dolichopus frontalis n. sp.

Male: Length 5 mm. Face ochre yellow. Front blue-green. Antennae with first joint yellow, narrowly black above; second and third joints black, third a little longer than wide, rounded at tip. Lower orbital cilia whitish, about seven of the upper cilia on each side black.

Thorax and abdomen shining blue-green. Hypopygium metallic green, nearly black, its lamellae large, oval, twice as long as wide, whitish with a rather wide, black apical margin, which is jagged and bristly.

Fore coxae, femora and fore and middle tibiae wholly yellow; fore coxae with a few minute yellow hairs on anterior surface; middle and hind coxae mostly black on outer and posterior surfaces; posterior femora with one preapical bristle, without cilia; posterior tibiae yellow, black at tip for nearly one fourth their length, the black extending further up on anterior surface, the usual glabrous stripe on upper edge can scarcely be traced, below they have a row of about six bristles of increasing length; middle tibiae with a pair of bristles below at apical third, one at basal third and one on lower anterior edge near the middle. Fore and middle tarsi black from the tip of the first joint, the former with second and third joints more yellowish brown when seen from below; hind tarsi wholly black; fore tarsi with the fourth joint a little widened, nearly as wide as long; fifth joint compressed, somewhat oval, half as wide as long, fringed with quite long black hairs above; middle basitarsus with a large bristle at apical third of upper edge; joints of fore tarsi as 49-27-15-8-20; of middle ones as 73-36-23-16-10; first four joints of posterior pair as 60-51-30-13. Calypters and halteres yellow, the former with black cilia.

Wings grayish; costa scarcely enlarged at tip of first vein; third vein bent back at its tip; last section of fourth vein a little bent just before its middle, its tip reaching the wing margin before the apex of the wing; last section of fifth vein slightly longer than the crossvein; hind margin of wing slightly indented at tip of fifth vein and with a slight lobe at tip of sixth vein (about as figured in the United States National Museum Bulletin 116, figure 149).

Type, male, No. 2499 in Canadian National Collection, taken by N. J. Atkinson, July 11, 1926, at Yankee Bend, Sask.

Dolichopus subspina n. sp.

Male: Length 4.5 mm. Face yellow. Front blue-green. First antennal joint very narrowly black on upper edge, but almost wholly yellow; second and third joints black, third a little longer than wide, rounded at tip. Lower orbital cilia yellowish white, about six of the upper cilia on each side black and short.

Thorax and abdomen shining blue-green. Hypopygium dark metallic green, its lamellae large, oval, twice as long as wide, whitish with a rather wide, black apical border, which is jagged and bristly.

Fore coxae, femora and fore and middle tibiae wholly yellow; fore coxae with minute pale hairs on anterior surface and black bristles at tip; middle and hind coxae yellow with most of outer and posterior surfaces black; posterior femora with one preapical bristle, nearly bare below and with a row of about six bristles of increasing length on the lower surface, their tibiae yellow, slightly brownish on anterior surface at tip, on posterior surface the brown extends further up and becomes nearly black at tip; middle tibiae with one pair of bristles below at apical third and a single one at basal third. Fore and middle tarsi black from the tip of the first joint, posterior pair wholly black; middle basitarsus with a very minute bristle near apical third, this is easily overlooked; fourth joint of fore tarsi widened, not quite as wide as long; fifth joint compressed, somewhat oval, twice as long as wide, fringed above with black hairs; joints of fore tarsi

as 46-20-12-8-17; those of middle ones as 70-31-22-14-13; joints of posterior pair as 58-51-23-20-12. Calypters and halteres yellow, the former with black cilia.

Wings about as in the preceeding species (*frontalis*).

Type, male, No. 2498 in Canadian National Collection, taken by Kenneth M. King, July 16, 1925, at Melfort, Sask.

This differs from *frontalis* in not having a large bristle on the middle basitarsus and less black on the posterior tibiae; the proportional length of the tarsal joints is also slightly different.

The two species described above, together with *walkeri* and *speciosus* form a group which are very closely related, they are separated by the following characters. *Speciosus* has the second joint of fore tarsi less than two thirds as long as fifth, all the others have the fifth joint distinctly shorter than the second; *subspina* has only a very small bristle on the middle basitarsi, this is so small that they might be said not to have any bristle on the middle basitarsi, while both the remaining forms have a large, conspicuous bristle on the middle basitarsi; *walkeri* has the first three joints of fore tarsi wholly yellow, fourth and fifth black, the hind tibiae yellow, not or scarcely darker at tip and the front green; *frontalis* has the front blue-green, almost blue, the fore tarsi black from the tip of the first joint and the hind tibiae black for one fourth their length.

NOTES ON THE SPECIES OF LINA AND ALLIED GENERA (COLLEOPTERA, CHRYSOM.).

BY CHAS. SCHAEFFER,
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In rearranging and briefly investigating the species of *Lina* and some allied genera in our collection, assisted by additional material kindly sent me by Messrs. Carr of Alberta, Hopping of British Columbia, Frost of Massachusetts, and Notman and Shoemaker of New York, the following notes were made, which in some cases correct a few misidentifications or add to the recorded distribution of some species.

The types of the new varieties and species are in the collection of the Brooklyn Museum.

Paratypes in the different collections are mentioned under the descriptions.

Lina interrupta Fab. This is wrongly given as a synonym of *lapponica* in the Leng catalogue. This latter is a European species and apparently does not occur here, at least none of the numerous specimens examined agree with typical *lapponica*. The European variety of *lapponica, litura,* is marked like typical *interrupta* but in the former the prothorax is always unicolorous metallic green.

Our common widely distributed species has the sides of prothorax pale—unicolorous metallic green in *lapponica* and varieties—and on each elytron are two basal spots frequently connected with each other below, sometimes above also but apparently never forming one large basal spot as in typical *lapponica*; further two submedian spots, one near suture and one near side margin, both rarely connected—in typical *lapponica* these spots always form one broad fascia with irregular outline—and generally a large, more or less arcuate subapical mark, often interrupted into two. The markings generally black, rarely with feeble aeneous tint—metallic green or blue in *lapponica;* the suture is generally more or less

black, occasionally pale. The femora are metallic green, tibiae more or less pale, sometimes the legs are entirely pale even in fully marked specimens. The markings on the elytra vary a good deal by extension or reduction and are often reduced to a number of black spots, however, the two varieties, described below, are distinct and deserve a name.

The typical *interrupta* is more widely distributed than indicated in the Leng catalogue. It apparently occurs everywhere in Canada, in Alaska, northern United States, Massachusetts, New York, New Jersey, Pennsylvania, Ohio, and Kentucky.

Lina interrupta quadriguttata n. var.

Form, size and color of typical *interrupta*, but having only two black, median spots on each elytron.

Alberta: Edmonton (type) and Mundare, June (Carr); Banff (Ottolengui).

New Jersey: Green Village, April (Rummel).

Paratypes of this form are in the Canadian National collection (Coll. Hopping) at Ottawa and Mr. Carr's collection.

Lina interrupta aeneicollis n. var.

The prothorax in this form is unicolorous black with more or less distinct greenish tint; all the black markings on the elytra are usually broadly confluent and the legs are either entirely metallic green, or occasionally some of the tibiae more or less pale. The size is generally a little smaller than in the typical form.

Alberta: Lake Louise, Aug. (Carr) type; Jasper Park, Whirlpool R., Sept. (Carr).

Brit. Columbia: Mt. McLean, Aug. (Hanham); Agassiz, Sept. Glendenning).

Montana: Granite Park, Glacier Park, July (Notman).

California: Gray Midw., Tulare Co., July (Hopping); Warner Mts., Modoc Co., July (Hopping).

Paratypes in the Canadian National coll. (Hopping coll.) and Mr. Carr's collection.

Some of the specimens, esp. those from Brit. Columbia and California have the elytra black, including the lateral margins, with pale spots and short, straight and narrow, transverse, sinuous lines, others are black with a number of pale spots only. Very few of the specimens seen have the lateral margin either entirely or partly pale. However, in none of the specimens do the two basal spots on each elytron completely unite into one solid spot, but are confluent above and below only, enclosing always a pale spot of variable size even in the darkest specimens. This readily separates the var. *aeneicollis* from the similarly marked *curvilinea*, a European variety of *lapponica*.

This variety, especially those specimens with darker elytra look quite distinct from typical *interrupta* but one of the specimens has the anterior angles of prothorax narrowly pale and in a specimen from Alaska the lateral margins of prothorax at base and apex are broadly pale.

Lina scripta F. This common species occurs almost everywhere in the United States and Canada and generally varies very little in the east. In Utah, California and Oregon a form occurs with unicolorous metallic blue, purple or

black elytra, rarely some of these have a few faint, pale lines, which are the typical *confluens*, intermediate between this and typical *scripta* are specimens with elytral markings more or less confluent. I have also seen a few specimens from California with entirely pale elytra, except a black spot on the humeral callosity and in one of these specimens the elytral markings are faintly indicated by slightly darker color.

The variety *texana* Schffr. is generally pale beneath including the legs, except tarsi; the head and prothorax are unicolorous reddish, with a more or less distinct greenish metallic tint and the elytra have the usual black markings of the typical form, but are generally coarsely punctate.

The following and apparently distinct new variety occurs in Utah.

Lina scripta maculicollis n. var.

Form, size and markings as in typical *scripta* except the prothorax, which is pale, with two oblique dark metallic green marks at middle of disk and between these, but slightly below, a smaller, more or less elongate spot; the usually small, black spot at middle near lateral margin generally faint; the short linear mark near suture at middle of each elytron is generally less intense black than the rest of the markings and occasionally nearly obliterated; the elytral suture is very narrowly black except near apex.

Utah: Beaver Creek, May (Doll & Englehardt).

About a dozen specimens were taken of this new variety together with specimens of the form with unicolored metallic blue elytra but no specimens of the typical *scripta*, that is, with the median part of prothorax dark metallic green were taken.

Lina obsoleta Say. This species is a very variable insect. Typical *obsoleta* have the head, prothorax at middle and the elytra black, the elytra with the margins and a few short lines on the disk pale. The number of these short, pale lines is variable; they are gradually reduced to small juxta-scutellar spots or are entirely absent, but in all these the lateral margins are always entirely pale. The other extreme, that is, the gradual increase of the pale color, produces finally a form which is marked exactly like *scripta*. The coloration of the prothorax is also variable and is either dark at middle and pale at sides, or entirely pale with three dark spots at middle, occasionally the prothorax is entirely pale without markings. These variations may be found in the darker as well as paler forms.

The extreme form, marked like *scripta*, is usually found associated in collections with that species and to avoid further mistakes, it seems advisable to give it a name.

Lina obsoleta scriptoides n. var.

Form and size of *obsoleta* but elytra pale, marked like *scripta;* prothorax either with three black spots at middle, two of these oblique and the third smaller, below these two, or median part black, sides pale, or prothorax entirely pale without markings.

New Jersey: Green Village, (Rummel); Hamburg (Engelhardt). New York: West Point, June (Schaeffer) type. New Hampshire: Claremont, May (Engelhardt). Wisconsin: Milwaukee (O. Dietz). Alberta: Edmonton (Carr in coll. Hopping).

Paratypes from Edmonton, Alberta, in the Canadian National collection,

(coll. Hopping).

This variety resembles *scripta* very much in elytral markings, but is a shorter and more convex insect when viewed laterally, with a wider prothorax and the elytral apices of the female are more feebly produced.

On one of the pleasant collecting trips made in the neighborhood of West Point in company with Colonel Robinson and Mr. Wm. T. Davis a number of specimens of *obsoleta* were taken on willow among which all the intermediate forms between the var. *scriptoides* and typical *obsoleta* were present.

Lina immaculata Schffr. This is our smallest species and is strictly western. It occurs in Alberta, Brit. Columbia, Oregon, Washington and California.

The prothorax is pale at sides, at middle black with more or less distinct aeneous tint; the elytra are flavous or slightly reddish and always without markings or dark bronze or black with feeble aeneous tint. The elevated ridge along the lateral margins—generally prominent and well limited internally in our other species—is always very poorly limited in this species. The punctuation of the elytra is variable, from relatively sparsely to densely punctate.

Specimens with dark elytra resemble superficially the European *collaris* in which the elevated ridge along the lateral margin of the elytra is also poorly limited, but *collaris* is slightly more convex and without distinct humeral collosity on the elytra.

A single specimen in the collection of Mr. Hopping from Victoria, B. C., has the prothorax and elytra uniformly dark aeneous.

Lina tremulae F. This well known species is readily distinguished by its unicolorous aeneous prothorax and immaculate, flavous elytra. It seeems to vary very little except in elytral punctuation. To the recorded localities in the Leng catalogue I can add: Manitoba, Alberta, New York, and New Jersey.

Gastroidea formosa Say. In the Leng catalogue this species is wrongly placed as synonym of the European *viridula* De G. The latter is a larger species, more shining, of more uniform green or bluish-green color and coarser punctuation on prothorax and elytra.

Gastroidea aenea Melsh. This species was described from Pennsylvania but apparently has never been recognized. On one of my visits to the Museum of Comparative Zoology, Cambridge, studying the Leconte and Melsheimer types of Donacia, I looked also for the types of this species. In the general collection of the Museum I located several Melsheimer specimens labelled *Gastrophysa aenea* Melsh., the label apparently written by Melsheimer. These specimens agree very well with his description and I have no doubt that they are his types. However, it is not a Gastroidea but our well known common species *Nodonota puncticollis* Lef. with which *Gastrophysa aenea* has to be placed as synonym.

Gastroidea dissimilis Say. Of this species, specimens were taken at Great Falls, Casode Co., Montana, June 15, by Mr. Howard Notman.

Phyllodecta vulgatissima L. and *viminalis* L. Our common insect, occasionally identified as one or the other of these two European species, is a different insect and is described below as *americana*.

Phyllodecta americana n. sp.

Male. Color above variable, purple or purple suffused with green, occasionally entirely metallic green, reddish cupreous or brassy. Below dark green, sometimes more or less brassy, last ventral segment with more or less distinct pale margin, legs black, femora occasionally with faint metallic green tint. Head moderately closely punctate without longitudinal median impression. Antennae black, second joint pale beneath, second slightly shorter than third, fourth and fifth equal but each shorter than second joint, joints four to six with three or four erect fine hairs below, which are slightly finer and paler than the regular apical bristles. Prothorax nearly quadrate, very slightly narrower at base than the elytral base; sides very feebly narrowing from base to apex, thence slightly arcuate to apex; anterior margin moderately strongly emarginate, angles prominent; posterior margin slightly arcuate, angles nearly rectangular; surface finely and sparsely punctae, more coarsely at sides and near basal margin. Elytra nearly parallel about three times as long as the prothorax at middle, with regular rows of moderately large punctures; intervals with a single row of more or less distinct, irregularly placed, small punctures. Ventral segments wih an apical row of punctures, the rest of the surface nearly smooth. First joint of all the tarsi dilated but not quite as wide as the third joint. Length 3.75 mm.

Female. As usual, differs from the male in being a little stouter and larger, the first joint of all the tarsi not dilated and the row of erect, pale hairs on the fourth to sixth joint of the male are absent in the female.

PENNSYLVANIA: Mt. Pocono, June (Nicolay); Starlight, June (Shoemaker). NEW YORK: Oliverea, June (Shoemaker) type; De Bruce, July (Shoemaker); Keene Valley, May, June and August (Notman); Sylvan Beach, June (Notman); Shobarie, June (Notman); Nichols, May (Notman); Lowville, June (Notman); Waterville, June (Notman); Frt. Hunter, May (Notman) Whiteface Mt., July (Shoemaker). MASSACHUSETTS: Framingham, May (Frost); Hopkinton, March (Frost). MAINE: Orone, June (Parshley). ONTARIO: Toronto, July (coll. Hopping). NEW BRUNSWICK: Penobaquis, July (Frost). NOVA SCOTIA: Portaupique, July (Frost). BRIT. COLUMBIA: Terrace (Mrs. Hippisley in coll. Frost); Vernon, May (Hopping). ALBERTA: Edmonton, May (Carr, in coll. Hopping).

Paratypes in the collections of Messrs. Frost, Notman and Shoemaker.

The prothorax is variable, in some specimens the sides are gradually narrowing from base to apex, in others are parallel and occasionally a distinct, though shallow, transverse, subbasal impression is present. The punctuation is also variable. The regular rows of punctures on the elytra are confused at sides in some specimens, in others they are more or less regular.

This species is close to European *vitellinae* from which it differs in having the second antennal joint longer; and fourth to sixth joints of the male have an additional row of erect hairs as in *vulgatissima*. The usual color of *vitellinae* is generally metallic green or blue, in *americana* purple, often more or less suffused with green though unicolorous green, coppery or brassy specimens occur but not so frequently.

The European *vulgatissima* is slightly more elongate than *americana,* has a distinct, though very fine, basal marginal bead of prothorax, the row of fine erect hairs on the fourth to sixth antennal joints is present in both sexes, the second and third joints are equal in length and the first joint of middle and hind tarsi of the male are more elongate and more dilated than in *americana.*

The color of the legs is always uniformly dark metallic in the two European species but in *americana* specimens occur which have the tarsi and tibiae either entirely or partly pale. These might be confused with the European *tibialis* of which the typical form has the tibiae pale, but dark metallic in the variety *cornelii.*

Phyllodecta americana pallipes n. var.

Differs from typical *americana* in having the tarsi and tibiae in great part or entirely pale.

Ohio (O. Dietz).

The color of the upper surface is bright cupreous.

The only species of this genus in which specimens with bicolored legs occur is the European *tibialis.* In these, however, the fourth antennal joint is longer, the fourth to sixth joints without the additional row of pale hairs in both sexes, the first joint of middle and hind tarsi of the male much more strongly dilated and the claw joints of tarsi longer.

Phyllodecta interstitialis Mann. Of this species, which was described from Alaska, I have not seen any specimens. The elytra are said to be "crebre punctatis, punctis versus suturam in strias seriatis." This peculiar sculpture of the elytra of the unique type, if not abnormal, certainly makes it distinct from the known European and American species.

Phytodecta scutellaris Sahlb. This is wrongly listed in the Leng catalogue as a Phyllodecta. By its bicolored legs—dark femora and pale tibiae—it has to be placed near *arctica.* From the description it has a larger scutellum than usually found in the species of this genus with sides and apex continuously rounded. The head and body below black, antennae at base, femora at apex, tibiae, margins of ventral segments, prothorax and elytra ferruginous. It was described from a single specimen collected on the American coast, Behring Strait (possibly near Port Clarence) by the Vega Expedition.

Phytodecta arctica Mann. Specimens which fairly agree with the description of this species, described from Alaska, were taken by Mr. Howard Notman at Hidden Lake, Glacier Park, Montana, July 15.

Phytodecta notmani Schffr. This more recently described species occurs also in Alberta, where it was taken by Mr. Carr at Medicine Hat. The specimens sent me by Mr. Carr are without markings on prothorax and elytra and have the head not black but either pale or partly black and were considered at first small, pale specimens of *americana.* However, the male genitalia proved to be the same as in typical *notmani.*

Ph. notmani is generally smaller and relatively narrower than *americana* and has the anterior margin of clypeus truncate, which latter is more or less broadly emarginate in *americana.*

TWO NEW SPECIES OF WAGNERIA (TACHINIDAE, DIPT.).*

BY C. H. CURRAN,
Ottawa, Ont.

The genus *Wagneria* Desvoidy is represented in America by about a dozen described species, including those named in the present contribution. Two of these I am unable to recognize, the others being included in the key. The two new species differ from the others in the genus by possessing infra-squamal setulae and lacking discals on the intermediate abdominal segments of the males in addition to being larger than the allied species.

Wagneria Desvoidy.

Myodaires, 126, 1830.
Phorichaeta Rondani, Dipt. Ital. Prodr., IV, 8, 1861.
Metachaeta Coquillett, Journ. N. Y. Ent. Soc., III, 98, 1895.
Micromintho Townsend, Pr. U. S. N. M., LVI, 555, 1919.
Metallicomintho Townsend, Pr. U. S. N. M., LVI, 55.
Pachynocera Townsend, Pr. U. S. N. M., LVI, 585, 1919.

TABLE OF SPECIES.

1. First vein bare ..... 5.
   First vein setose ..... 2.
2. First vein bare on apical section ..... 3.
   First vein setose on apical section (Arizona) ..... *melania* Townsend.
3. Abdomen without conspicuous pale pollen ..... 4.
   Abdomen with basal whitish pollinose fasciae on segments two to four (Texas) ..... *distincta* n. n.
4. Pollen of the mesonotum inconspicuous (Widespread) .... *helymus* Walker.
   Mesonotum with three well developed whitish pollinose vittae anteriorly (Arizona) ..... *abdominalis* Townsend.
5. Abdomen without conspicuous pale pollen ..... 6.
   Abdomen with whitish pollinose fasciae on segments two to four (Peru). ..... *petiolata* Townsend.
6. Mesonotum with distinct whitish pollen from posterior view ..... 7.
   Mesonotum without distinct whitish pollen, if the pollen is moderately distinct infra-squamal setulae are present ..... 8.
7. Penultimate aristal segment little longer than wide (Widespread) .... *cinerosa* Coquillett.
   Penultimate aristal segment three times as long as wide (Europe) .... *fuliginosa* Rondani.
8. Arista black or brown ..... 9.
   Arista red on basal half (N.Y., Ont., Que.) ..... *vernata* West.
9. Infra-squamal setulae absent; abdomen with erect discals *sequax* Williston.
   Infra-squamal setulae present ..... 10.
10. Third antennal segment not over two and one-half times as long as the second (N. B., Mass.) ..... *cornuta* n. sp.
    Third antennal segment at least three times as long as the second (Arkansas) ..... *major* n. sp.

Wagneria major n. sp.

Shining black, with inconspicuous brownish grey pollen; palpi reddish; veins bordered with blackish; first vein bare. Length 5.5 to 7.25 mm.

*—Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

Male. Head greyish pollinose the parafrontals thinly so; cheeks almost two-thirds as wide as eye-height, the soft part reddish. Occipital pile luteous. Parafacials with four to six bristles and several hairs, wide, scarcely narrowing below. Antennae deep black, long, the second segment longer than wide, third very wide, gently widening to the sub-truncate apex, three times as long as second; arista thickened on basal half, the penultimate segment decidedly wider than long.

Pollen of thorax not conspicuous; acrosticals 3-3; dorsocentrals 2-3; sternopleurals 2-1; three pairs of marginal scutellars, the apical pair cruciate. Several setulae below inner end of squamae.

Legs black; pulvilli brownish; not reduced. Wings cinereous hyaline, the veins bordered with blackish, the apical crossveins strongly so.

Abdomen shining black. First segment without marginals, second and third each with a pair, the third with several lateral marginals, fourth with a row and two rows of discals on apical half; third segment with the hair along the median line bristly but appressed.

Female. Second antennal segment twice as long as wide, the third segment hardly three times as long as the second and narrower; wings much more heavily clouded.

Holotype.— ♂, *allotype.*— ♀, and 17 ♂ paratypes, Fayeteville Ark., Feb. 23, 1927, (D. G. Hall). Types in the United States National Museum; paratypes, No. 2668 in the Canadian National Collection.

Wagneria cornuta n. sp.

Shining black, the thorax with very thin brownish grey pollen; palpi bright reddish; soft part of cheeks rusty reddish.

Male. Differs from *major* as follows: Third antennal segment very broad, about two and a half times as long as the second, which is longer than wide; arista thickened on basal third, the basal segments short; cheeks less than half as wide as eye-height; abdomen without trace of pollen.

Female. Antennae narrower than in male; second and third abdominal segments each with pair of erect discals; front tarsi strongly widened.

Holotype.— ♂, Melrose Highlands, Mass., June 7, 1909 (W. R. Thompson), No. 2669 in the Canadian National Collection.

Allotype.— ♀, Barber Dam, N. B., June 25, 1914 (F. M. McKenzie).

Paratypes.—2 ♀, Oromocto, N. B., July 9, 1913 (J. D. Tothill).

Wagneria distincta n. n.

Metachaeta cinerosa Reinhard, Ent. News, XXIV, 268, 1923, (nec Coquillett).

This change of name is necessitated by the use of the name *cinerosa* by Coquillett in *Phorichaeta*, which I consider a synonym of *Wagneria*. The species occurs rather commonly in Alberta.

TETRAPHLEPS CANADENSIS PROVANCHER, A TRUE TETRAPHLEPS* (HEMIP.)

BY C. J. DRAKE AND H. M. HARRIS,
Ames, Ia.

Through the courtesy of Professor George Maheux, Provincial Entomologist of the Department of Agriculture of the Province of Quebec and Curator of the Quebec Public Museum and Mr. G. S. Walley of the Department of Agriculture of Canada, the writers have recently had the privilege of studying the type specimen of *Tetraphleps canadensis* Provancher. The specimen is a true *Tetraphleps* and not a *Lycotocoris* as was at one time supposed. A comparison with the holotype of *T. americana* Parshley, kindly loaned for study by Dr. H. M. Parshley of Smith College, shows that this name must stand as a synonym of *canadensis*. Provancher's description with further notes is given below.....

"Tetraphleps du-Canada. *Tetraphleps canadensis* n. sp. Female—Long. 18 pce. Noir avec les elytres testacees. Tete longue et etroite, l'epistome depassant les joues. Antennes moins de la moitie du corps en longueur, le 2e article le plus long, les 2 derniers fusiformes. Elytres d'un testace brunatre, avec teinte plus foncee vers le milieu, a coin fort long, la membrane plus ou moins obscure avec 4 nervures longitudinales tres distinctes. Dessous noir. Pattes brun-roussatre. Un seul specimen capture par nous au Cap. Rouge."

Obovate, piceous brown, the hemelytra varying from light to dark brown. Legs piceous brown, the tibiae and apices of femora lighter. Upper surface shining, clothed with slightly curled, reclining, pale pubescence. Ocelli widely separated. Antennal proportion (female), 5: 16: 10: 10, (male), 5: 18: 10: 10. Rostrum slender, extending to middle of mesosternum, segment I hardly attaining the anterior margin of the eyes. Ostiolar canal straight, projecting slightly backwards. Clasper of male strongly arcuately curved. Length (female), 3.5 to 3.78 mm., (male), 3.35 mm.; width (female), 1.3 to 1.48 mm., (male), 1.28 mm.

Redescribed from the holotype (female) in the Provancher collection of the Quebec Public Museum, Quebec, and a male (allotype Nordegg, Alta., Aug. 4, 1921, collected by J. McDunnough on Larch (*vide* Knight, *op. cit.* p. 182, 1925). In the holotype the color of the hemelytra is somewhat paler than in the more recently collected specimens; this lighter color is undoubtedly due to age and fading. The rostrum is missing. The type came to us mounted on a point in such a way that the sides and undersurface could not be seen, but has been remounted so that the ostiolar canal is visible. This specimen does not differ in any essential character from the holotype (female) *T. americana* Parshley. Other specimens collected with the allotype are also at hand. The synonym of *T. canadensis* as now known is given below.

Tetraphleps canadensis Provancher, Pet. Faune Ent. Can., III, 1886, p. 90.
Tetraphleps canadensis Lethierry and Severin, Cat. Hemip., III, 1896, p. 245.
Tetraphleps canadensis Banks, Cat. Nearc. Hemip.-Heterop., 1910, p. 24.
Lyctocoris canadensis Van Duzee, Can. Ent., XLIV, 1912, p. 320.
Lyctocoris canadensis Van Duzee, Check List Hemip., 1916, p. 34.
Lyctocoris canadensis Van Duzee, Cat. Hemip., 1917, p. 289.
Tetraphleps americana Parshley, Can. Ent., III, 1920, p. 5.
Tetraphleps canadensis Van Duzee, Proc. Calif. Acad. Sci., XI, 1921, p. 142.
Tetraphleps americana Knight, Can. Ent., LVII, 1925, p. 182.
Tetraphleps americana Blatchley, Heterop. Eastern North Amer., 1926, p. 633.
Tetraphleps canadensis Blatchley, Heterop. Eastern North Amer., 1926, p. 634.

*—Contribution from the Department of Zoology and Entomology, Iowa State College, Ames, Iowa.